

PROBLEM SOLVING USING EQUATIONS FOR UNIFORMLY ACCELERATED MOTION

1. A subway train travelling west at 20 m/s is brought to rest in 10 s. Find the displacement of the subway train while it is coming to a stop. Assume uniform acceleration.
2. A jockey travelling at its top velocity of 16 m/s [W] slows down uniformly to a velocity of 4.0 m/s [W] in 5.0 seconds. What is the displacement of the jockey during this time?
3. A ball moves up a long driveway with an initial velocity of 5.0 m/s. Four seconds later it is moving down the driveway at 10 m/s. Determine the object's displacement.
4. An SUV with an initial velocity of 10 m/s [E] accelerates at 5.0 m/s^2 [E]. How long will it take the SUV to acquire a final velocity of 25 m/s [E]?
5. A motorcycle with an initial velocity of 3.0 m/s [N45°W] accelerates at 4.0 m/s^2 [N45°W]. How long will it take the motorcycle to reach a final velocity of 33 m/s [N45°W]?
6. An elk moving at a velocity of 18 km/h [N] accelerates at 1.5 m/s^2 [N]. How long will it take the elk to reach its top velocity of 72 km/h [N]?
7. A golf ball rolls up a steep hill. It is initially travelling at 25 m/s and slows down with an acceleration of -5.0 m/s^2 . Find its displacement after 15 s.
8. A skier is moving down a uniform slope at 2.0 m/s. If the acceleration down the hill is 3.0 m/s^2 , find the skier's displacement after 6.0 s.
9. A bus travelling at 100 km/h reaches a steep hill and accelerates at -0.40 m/s^2 for 1.0 minute. How far up the hill did the bus travel in this time frame?
10. A dune buggy accelerates from rest to a velocity of 26 m/s [S] in a time of 6.0 s. Assuming uniform acceleration, determine:
 - a. The buggy's acceleration
 - b. The buggy's displacement and,
 - c. It's average velocity
11. An avalanche sliding down the Swiss Alps has a constant acceleration of 3.0 m/s^2 [down]. If it takes 6.0 s to cover a displacement of 78 m [down], determine:
 - a. It's initial velocity
 - b. It's final velocity
12. Iain delivers a curling stone, releasing it just before the hog line. The stone travels 28 m in 22 s. Assuming uniform acceleration, determine the initial velocity of the stone as well as the acceleration of the stone. **NOTE: The Stone Comes to Rest...**

13. A competitor is aiming to complete a 1500 m wheel-chair race in less than 4.0 minutes. After moving at a constant speed for exactly 3.5 minutes, there was still 240 m to go. What must have been his acceleration in order for him to finish the race in exactly 3 minutes 59.9 seconds?

14. A sportscar is advertised as being able to stop, from a speed of 100 km/h, within 45.0 m. What acceleration must it experience?

15. A beetle bug travelled 40 m [S], then 50 m [W] followed by 30 m [N30°E] in 4.25 minutes. Determine the average velocity of the bug.

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| 1. 100 m [W] | 2. 50 m [W] |
| 3. 10 m [down the driveway] | 4. 3.0 s |
| 5. 7.5 s | 6. 10 s |
| 7. -187.5 m | 8. 66 m |
| 9. 947 m | 10. 4.33 s, 75 m, 13 m/s |
| 11. 40 m/s [S], 22.0 m/s [S] | 12. 2.55 m/s, -0.12 m/s ² |
| 13. 0.136 m/s ² | 14. -8.57 m/s ² |
| 15. 0.148 m/s [W21.8°S] | |